

Antibiotic Stewardship Improvement Initiative at a Veterans Health Administration Ambulatory Care Center

David Cooperman^a; Winnie Angerer, PharmD^a; and James Barry Fagan, MD^a

Background: The negative impact of unnecessary antibiotic prescribing is well known and includes risks of antibiotic adverse effects, overgrowth of pathogenic organisms, unnecessary costs, and selection of antibiotic-resistant organisms in the populace at large. Acute viral respiratory infections are among the leading causes of inappropriate antibiotic usage.

Methods: This study examined the effect on inappropriate antibiotic prescribing rates of educating clinicians regarding antibiotic stewardship and making a prepackaged kit (containing symptom relief and patient education) for clinicians to distribute to patients with viral upper respiratory tract infections vs writing a prescription for antibiotics.

Results: Between December 1, 2018, and March 31, 2019, 357 viral illness support packs were distributed. Antibiotic prescriptions for the diagnostic codes pertaining to viral upper respiratory tract infections were tracked and compared to a similar period from December 1, 2017, to March 31, 2018. A 9% reduction in antibiotic prescriptions was observed ($P = .02$).

Conclusions: The results of this project demonstrate that the combination of patient education and the ready availability of a nonantibiotic symptomatic treatment option can significantly decrease the unnecessary prescribing of antibiotics for viral illnesses.

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Fed Pract. 2022;39(8).
Published online August 9.
doi:10.12788/fp.0302

The negative impact of the unnecessary prescribing of antibiotic is well known. Consequences include exposing patients to antibiotic adverse effects, risk of overgrowth of pathogenic organisms such as clostridial species, unnecessary cost of drugs, and development of selection of antibiotic-resistant organisms in the populace at large. Acute viral respiratory infections are among the leading causes of inappropriate antibiotic usage.¹ In a study of 1000 adults with respiratory tract infections in an outpatient setting, 77% of patients were prescribed antibiotics, and the treatment was inappropriate in 64% of those who received prescriptions.² Patient expectations and clinician perceptions of these expectations play a role. One study showed that 54% of clinicians felt their patients expected to receive antibiotics for a visit due to an acute respiratory infection (ARI), such as a cough or cold; 26% of patients did in fact have this expectation.³

The US Department of Veterans Affairs (VA) Central Ohio Health Care System is a large ambulatory care facility, with 4 associated community-based outpatient clinics, serving more than 43,000 central Ohio veterans and completing more than 500,000 medical appointments annually. An antimicrobial stewardship program has been in place since 2013. In May 2018, the clinical

pharmacist assigned to the program alerted medical leadership that, of 67 patients seen in primary care for ARIs between April 16, 2018, and May 15, 2018, 42 (63%) had been prescribed an antibiotic. Based on this finding, clinical leadership designed a process improvement program aimed at reducing inappropriate antibiotic usage for the treatment of uncomplicated ARIs likely due to viral pathogens. Key components were clinician and patient education and the substitution of a symptomatic treatment kit in place of an antibiotic prescription.

METHODS

Facility clinical leadership, assisted by Volunteer Services, developed a Viral Illness Support Pack to be dispensed by primary care practitioners (PCPs) to patients presenting with symptoms of viral ARIs. The contents of this support pack are shown in the Figure. Patients were provided with tissues, throat lozenges, lip balm, acetaminophen, hand sanitizer, a surgical mask, patient instructions, and the Antibiotics Aren't Always the Answer pamphlet.⁴ The contents of the viral support pack were purchased through Volunteer Services using donated funds. In total, 460 packs were distributed to the primary care patient aligned care teams (PACTs), including the community-based outpatient clinics.

Clinicians and care teams received academic detailing prior to distribution of the viral support packs, stressing the importance of avoiding antibiotics to treat viral illnesses. Viral illness support packs were available for distribution from December 1, 2018, through March 31, 2019. The frequency of antibiotic dispensing to patients coded for ARI during this period was compared with that of the same time period in the previous year. All charts were reviewed for coding accuracy. Patients with illnesses requiring antibiotic treatment, such as pneumonia, exacerbations of chronic obstructive pulmonary disease and chronic bronchitis, and streptococcal pharyngitis, were excluded from the study. Statistical significance was determined using the unpaired *t* test.

RESULTS

From December 1, 2018, to March 31, 2019, 357 viral support packs were distributed to patients (Table). For the historical control period from December 1, 2017, through March 31, 2018, 508 patients were treated for ARIs. Of these, 295 (58%) received clinically inappropriate antibiotics. In contrast, of the 627 patients treated for ARIs during the study period from December 1, 2018, through March 31, 2019, 310 (49%) received clinically inappropriate antibiotics. The 9% decrease during the period when viral support packs were distributed, compared with the prior year, was statistically significant ($P = .02$).

DISCUSSION

The decrease in antibiotic prescriptions for ARIs was statistically significant. The success of this project can be attributed to 3 factors: clinician education, patient education, and the option for PCPs to provide symptomatic treatment for these patients rather than prescribe an antibiotic.

The importance of antibiotic stewardship has been emphasized to all PCPs at the VA Central Ohio Health Care System. Antibiotic stewardship has been the subject of grand rounds. Prior to distribution of the viral support pack, the chief of specialty medicine, the project's champion, spoke to all PCPs. Adequate numbers of viral support packs were distributed to all primary care teams.

TABLE Antibiotics for Acute Respiratory Illness

Antibiotics received	Control period, No. (%)	Study period, No. (%)
December		
No	51 (40)	77 (54)
Yes	75 (60)	65 (46)
January		
No	70 (40)	91 (49)
Yes	105 (60)	95 (51)
February		
No	58 (54)	67 (54)
Yes	53 (46)	58 (46)
March		
No	39 (41)	82 (47)
Yes	57 (59)	92 (53)
Total ^a		
No	213 (42)	317 (51)
Yes	295 (58)	310 (49)

^a $P = .02$.

FIGURE Viral Illness Support Pack Contents



In addition to direct clinician-to-patient education at the time of the patients' visits, educational materials were included in the viral support pack. The Antibiotics Aren't Always the Answer pamphlet is available from the Centers for Disease Control and Prevention. It covers the importance of antibiotic awareness, discusses what antibiotics do and do not treat, how to stay healthy, and causes of antibiotic resistance. The pamphlet contains the clear message that antibiotics are not only ineffective against viral illness, but also can cause significant undesirable outcomes.

The pamphlet Viral Illness Support Pack Traffic Light Card (eAppendix available online at doi:10.12788/fp.0302) provides important clinical information to the patients about their illness. Patients are instructed to contact their primary care team

if they are worse after 3 days of illness; symptoms are not improving after 10 days; or they experience blood in respiratory secretions, chills or generalized aching, and localized pain that is one-sided or significantly worsening. Patients are clearly informed to seek further care if not improving with symptomatic treatment.

The ability to provide patients with symptomatic relief, including throat lozenges, lip balm, and acetaminophen, was felt to be important in the success of the project. Furthermore, this eliminated an extra step of the patient needing to visit the pharmacy.

Limitations

Limitations of the study included starting distribution of the support packs somewhat after the onset of the viral illness season, failure to reach all prescribers for academic detailing at the start of the program, and several instances of temporary unavailability of the support packs in some areas.

CONCLUSIONS

Patients with ARIs are often significantly symptomatic and frequently believe that they require an antibiotic for treatment. Clinicians may adjust their behavior in response to their patients' expectations, stated or unstated. The results of this project demonstrate that the combination of patient education and the ready availability of a nonantibiotic symptomatic treatment option can significantly decrease the unnecessary prescribing of antibiotics for viral illnesses.

Acknowledgments

The authors are grateful to Ms. Traci Washington for assistance in sourcing materials; to Karen Corr, PhD, and Anthony Restuccio, MD, for advice on methods; to Mr. Daniel Pignatelli for assistance with data interpretation; and to Mr. Keith Skidmore, Ms. Crystal

Conley, and Ms. Megan Harris for assistance with assembling the Viral Illness Support Packs.

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Dr. Fagan has served on the Speakers Bureaus for Allergan (Teflaro), AstraZeneca (Symbicort, Bevespi, Daliresp), Boehringer Ingelheim Pharmaceuticals (Combivent, Atrovent, Spiriva), GlaxoSmithKline (Serevent, Advair), Forest Pharmaceuticals (Tudorza, Daliresp), Mylan Pharmaceuticals (Perforomist), Ortho-McNeil (Levaquin), Pfizer (Spiriva, Chantix, Exubera), and Wyeth Pharmaceuticals (Zosyn). Tylenol, which was a component of the Viral Illness Support Pack, is distributed by McNeil Consumer Healthcare Division. Dr. Fagan was engaged with the Ortho-McNeil Speakers Bureau in the marketing of Levaquin from 1996-1997. Dr. Fagan's current financial relationship is with AstraZeneca only (Symbicort, Bevespi, Daliresp). He serves on the Speakers Bureau. The remaining authors report no actual or potential conflicts of interest or outside sources of funding with regard to this article.

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eAppendix Viral Illness Support Pack Traffic Light Card

<p>SORE THROAT Soothe a sore throat with ice chips, sore throat spray, popsicles, or lozenges Use an ultrasonic humidifier or cool mist vaporizer Gargle with salt water Drink warm beverages Take acetaminophen to relieve pain or fever but only up to 2000 mg in any 24 hour period.</p> <p>EAR PAIN Put a warm moist cloth over the ear that hurts Take acetaminophen to relieve pain or fever but only up to 2000 mg in any 24 hour period.</p> <p>RUNNY NOSE Get plenty of rest Increase fluid intake Use a decongestant or saline nasal spray to help relieve nasal symptoms. Stop the decongestant after 3 days.</p> <p>SINUS PAIN/PRESSURE Put a warm compress over the nose and forehead to help relieve sinus pressure Use a decongestant or saline nasal spray Breathe in steam from a bowl of hot water or shower Take acetaminophen to relieve pain or fever but only up to 2000 mg in any 24 hour period.</p> <p>COUGH Use sugar-free cough lozenges. Use an ultrasonic humidifier or cool mist vaporizer Breathe in steam from a bowl of hot water or shower Use non-medicated lozenges</p> <div style="text-align: center;">  <p>VIRAL ILLNESS SUPPORT PACKET TRAFFIC LIGHT CARD</p> <p>Chalmers P Wylie VA ACC 420 N James Rd. Columbus, OH 43219 614-257-5200</p> </div>	<table border="1"> <thead> <tr> <th data-bbox="787 627 1085 658">HOW AM I FEELING?</th> <th data-bbox="1100 627 1398 658">WHAT SHOULD I DO?</th> </tr> </thead> <tbody> <tr> <td data-bbox="787 658 1085 814"> <p>RED ZONE Worse than yesterday after 3rd day of sickness Symptoms not improving after 10 days Blood in respiratory secretions Chills or generalized aching Localized pain that is one-sided or significantly worsening Unusual shortness of breath</p> </td> <td data-bbox="1100 658 1398 814"> <p>RED ZONE Contact your VA Provider Seek further medical care if unable to contact VA Provider Withhold smoking</p> </td> </tr> <tr> <td data-bbox="787 814 1085 959"> <p>YELLOW ZONE Feel no better than yesterday Fever of 101 or lower, not sustained Nasal/Lung secretions darker or thicker, without blood present Pain persisting or slightly worse (ie. Muscle aches, sore throat)</p> </td> <td data-bbox="1100 814 1398 959"> <p>YELLOW ZONE Continue symptomatic therapy as long as symptoms persist Evaluate your symptoms tomorrow Follow suggestions on reverse Withhold smoking</p> </td> </tr> <tr> <td data-bbox="787 959 1085 1114"> <p>GREEN ZONE Feeling somewhat better than yesterday No significant or sustained fevers Nasal/Lung respiratory secretions lighter in color or decreasing in volume Pain (ie muscle aches, sore throat, chest ache from cough) getting better</p> </td> <td data-bbox="1100 959 1398 1114"> <p>GREEN ZONE Stop symptomatic therapy when you are ready Discontinue or minimize smoking</p> </td> </tr> </tbody> </table>	HOW AM I FEELING?	WHAT SHOULD I DO?	<p>RED ZONE Worse than yesterday after 3rd day of sickness Symptoms not improving after 10 days Blood in respiratory secretions Chills or generalized aching Localized pain that is one-sided or significantly worsening Unusual shortness of breath</p>	<p>RED ZONE Contact your VA Provider Seek further medical care if unable to contact VA Provider Withhold smoking</p>	<p>YELLOW ZONE Feel no better than yesterday Fever of 101 or lower, not sustained Nasal/Lung secretions darker or thicker, without blood present Pain persisting or slightly worse (ie. Muscle aches, sore throat)</p>	<p>YELLOW ZONE Continue symptomatic therapy as long as symptoms persist Evaluate your symptoms tomorrow Follow suggestions on reverse Withhold smoking</p>	<p>GREEN ZONE Feeling somewhat better than yesterday No significant or sustained fevers Nasal/Lung respiratory secretions lighter in color or decreasing in volume Pain (ie muscle aches, sore throat, chest ache from cough) getting better</p>	<p>GREEN ZONE Stop symptomatic therapy when you are ready Discontinue or minimize smoking</p>
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Abbreviations: ACC, ambulatory care center; VA, US Department of Veterans Affairs.